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EXAMINER

GRAYBILL, DAVID E

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Please find below and/or attached an Office communication concerning this application or proceeding.

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1 RECORD OF ORAL HEARING

2
3 UNITED STATES PATENT AND TRADEMARK OFFICE

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6 BEFORE THE BOARD OF PATENT APPEALS
7 AND INTERFERENCES

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10 Ex parte JOSEPH FJELSTAD and KONSTANTINE KARAVAKIS

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13 Appeal 2009-003367
14 Application 09/020,647
15 Technology Center 2800

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18 Oral Hearing Held: August 4, 2009

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22 Before JOSEPH F. RUGGIERO, ROBERT E. NAPPI, and CARL W.
23 WHITEHEAD, JR., Administrative Patent Judges

24
25 ON BEHALF OF THE APPELLANT:

26
27 DARYL NEFF, ESQ.
28 LERNER, DAVID, LITTENBERG,
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32
33 The above-entitled matter came on for hearing on Tuesday, August 4,
34 2009, commencing at 1:20 p.m., at The U.S. Patent and Trademark Office,
35 600 Dulany Street, Alexandria, Virginia, before Victoria L. Wilson, Notary
36 Public.

37

1 THE USHER: Calendar number 10. Appeal number 2009-3367.

2 Mr. Neff.

3 MR. NEFF: Good afternoon, gentlemen. My name is Daryl Neff,
4 attorney for the Appellant. I apologize for my voice today. It is usually
5 more melodic.

6 (Discussion off the record.)

7 MR. NEFF: Now, the error that occurred in this case, and the reason
8 why the prior art rejections cannot stand, is that the prior art does not show a
9 compliant layer that has sloping edges and it does not show bond ribbons.

10 Now, I brought with me a set of handouts that I would like to provide
11 to each of you, if you don't mind. The handout contain references to the
12 drawings and the claims that are on appeal, as well as some references to the
13 prior art that's at issue. So --

14 JUDGE NAPPI: This is all information that's available to the
15 examiner?

16 MR. NEFF: Yes.

17 Now, let me point out the -- the first -- on the first page, we are
18 referring to drawings that are on file in the application. The exact same
19 drawings are provided in a better form as a formal drawing on the second
20 page but these drawings are actually not on file yet in this case. They were
21 in the parent of this application. They were actually the formal drawings of
22 that parent application. I only provided them because they are better, they
23 are easier to read, than the drawings that are actually on file in this case.

24 But the -- as I said, there are problems with the prior art. The claims
25 (2) claims require that there be a compliant layer that covers a top surface of
26 the chip and the compliant layer itself must have a top surface and a sloping

1 edge that extends from the top surface to a bottom surface of that compliant
2 layer. The bond ribbons are required to extend along the sloping edges.

3 So I've shown references to the sloping edges in figure 2. There is a
4 sloping edge across the front that goes from the top surface downward.
5 There is a sloping edge across -- that extends along the side, the right side, of
6 that chip that comes down from that top surface, and another sloping edge is
7 shown in this figure that extends along the left edge of that compliant layer.

8 The bond ribbons extend along the sloping edges of the compliant
9 layer and they connect to a chip contact that is a contact of the chip
10 which is referenced here at item 110. So -- and that can be seen, you know,
11 obviously a little more clearly in the formal drawing. It can be seen quite
12 well in figure 1E where the bond ribbon extends downward along the
13 sloping edge along where reference number 170 is and extends to a chip
14 contact 110 to be able to connect with the chip.

15 Now, the problem with the prior art is the prior art merely shows a
16 compliant layer which has holes in the compliant layer and within those
17 holes are a metal filling, a metal filling to form a conductive via. A
18 conductive via is a very conventional structure in semiconductor fabrication
19 and panels. It is well-known to the world and to the examiners as being a
20 structure to be able to connect from a lower layer up to an upper layer. And
21 that structure consists of a layer with some holes in it, just mere holes
22 which -- in which there is a metal filling and the fact that it is a via structure
23 is borne out by the language of Kwon.

24 You know, it says that a photomask and photoresist combination
25 using the photomask and photoresist combination, the metal contact 28
26 openings are patterned and etched in the polyimide material.

1 It further says that, in the second quote, a connector base, 24, which is
2 up here on top, it makes electrical contact with metal contact, 28, that is the
3 actual central via filling, which the conductive coating, 30, that is the thin --
4 thinner layer along the walls here, that conductive coating, 30, surrounds the
5 metal contact.

6 So even though we don't -- even though what we are looking at here is
7 a sectional view, the language of Kwon makes it clear that they are talking
8 about an opening that has a surrounding conductive coating number 30 that
9 surrounds the metal contact material number 28 which is inside there.

10 And the third quote is indicating the V- shaped metal contacts, 28,
11 again, the same metal filling, they are V-shaped in this sectional view. You
12 know, if this was a perspective view, he would see that there is really a
13 conical kind of shape because there is a cup-shaped opening.

14 JUDGE RUGGIERO: Is your argument that in Kwon that the
15 contacts are not elongated or are not a ribbon or both?

16 MR. NEFF: That they are not -- they are not a ribbon, those contacts.
17 They are vias. And via is just a filling within a hole.

18 JUDGE RUGGIERO: They could be elongated?

19 MR. NEFF: I'm sorry?

20 JUDGE RUGGIERO: I'm sorry. I think I picked up your cough.

21 MR. NEFF: Well, we --

22 JUDGE RUGGIERO: They could be considered elongated or not?

23 MR. NEFF: It is -- we haven't taken a position on that because there
24 is nothing to indicate -- nothing in Kwon that indicates that they are
25 elongated. I mean they -- they go from a lower level to an upper level. We
26 don't know what the thickness of the material is so there is really -- it is

1 really not possible to know by looking at this sectional view whether it is
2 elongated or not.

3 JUDGE RUGGIERO: Okay.

4 MR. NEFF: Because, you know, if this were a plan view, you might
5 be able to see whether this extends and has a width.

6 JUDGE RUGGIERO: So your argument, then, is it is not a ribbon.

7 MR. NEFF: It is not a ribbon, yes.

8 JUDGE WHITEHEAD: What's considered to be a ribbon in
9 semiconductor art?

10 MR. NEFF: Well, a ribbon is a -- a long structure and it, you know,
11 can go from one place to another but is not a via. A via is a structure which
12 is well-known in the semiconductor art and if we had intended the word
13 "ribbon" to encompass via, it should have been reflected somewhere in the
14 application, you know, that we might have said something like, "and upon
15 ribbon might include something such as a via," but there is nothing like that
16 in our application.

17 JUDGE WHITEHEAD: So ribbon is basically metallization, right,
18 you are just talking about metallization that's applied on the substrate is what
19 the ribbon is?

20 MR. NEFF: Well, not -- that's not what we have intended it to be.
21 We have not intended ribbon to have that broad meaning. You know, as
22 shown in our application, ribbon -- ribbon is shown as a structure which,
23 you know, provides a conductive connection from one place to another.
24 It is --

1 JUDGE NAPPI: Isn't that what a via does, provides connection from
2 one place to another? Isn't that what we just said the via does, it gives us
3 connection from an upper surface to a lower surface?

4 MR. NEFF: That's true with a via but ribbon is different in the sense
5 that a ribbon is -- is a structure that generally has a length. It is a structure
6 which, you know, has a longer -- has greater length than its width and, you
7 know, I think if a via -- if the via was intended to -- if we had intended our --
8 this ribbon structure to include via, we would have, first of all, said
9 something that ribbon may include via or we could have shown via in our
10 application and there is no such thing.

11 JUDGE WHITEHEAD: So the ribbon is defined in the specification
12 of having what you said length longer than the width? You define that in
13 the specification like that?

14 MR. NEFF: I don't -- I don't -- I don't know if there is a -- there is a
15 definition provided for that in the specification. I think --

16 JUDGE RUGGIERO: What definition are you relying on then?

17 MR. NEFF: Well, I'm -- I'm -- I'm just relying on something which
18 I think, you know, should be clear within the ordinary meaning of
19 something such as a ribbon. You know, think of ribbon in common ordinary
20 experience. A ribbon doesn't extend --

21 JUDGE RUGGIERO: What is the ordinary -- common ordinary
22 meaning of "ribbon"?

23 JUDGE NAPPI: Where do we have the evidence to support that in
24 the record? It seems to me you are looking at figure 2 and saying I have an
25 item I'm calling a ribbon and it is different from what you have in the other
26 one because my item looks different than yours but, you know, I'm

1 looking -- the question is where is the definition to support what you are
2 saying, it has to be different?

3 MR. NEFF: I don't think -- I think what we would be relying on, our
4 position is, that if we intended ribbon to cover via, which is a well-
5 understood and well-known structure in this art, that we could have specified
6 that this would cover via.

7 I think ribbon is a different structure. It does not look like a via. It
8 does not -- a via is always formed within a hole in some layer; okay? And
9 this via in Kwon is formed within an opening of the compliant layer; okay?

10 And I think the important -- the most important thing here is that the
11 compliant layer in our claim and throughout our application, it has edges and
12 the edges are the edges of the entire layer and that's clear from the claim.

13 JUDGE WHITEHEAD: Looking at figure 1E that you gave us --

14 MR. NEFF: Yes.

15 JUDGE WHITEHEAD: Look at the ribbon as going down into area
16 110. Isn't that almost like a via?

17 MR. NEFF: Yes. That's -- in that case it -- the ribbon is connected to
18 the chip contact 110.

19 JUDGE WHITEHEAD: Through a via.

20 MR. NEFF: But there is no via through the compliant layer. I mean
21 we are not talking about an opening in the compliant layer to make -- to
22 make the --

23 JUDGE NAPPI: Isn't that what's going to go over to the next
24 contact layer there, 61, isn't that -- looking from the far left to far right of
25 figure 1A?

1 MR. NEFF: Compliant layer, I believe, 160, if I'm not mistaken, 160
2 is a solder mask layer. I believe it is the dielectric layer to -- that's probably
3 used to prevent solder or other things that are attached to the terminals from
4 spreading beyond where they should.

5 JUDGE WHITEHEAD: Okay. But what's on the far left and far right
6 of your figure 1E? What's below item 160?

7 MR. NEFF: Below item 160, I believe that would be a part of an
8 underlying dielectric layer.

9 JUDGE WHITEHEAD: So that's not part of the compliant layer?

10 MR. NEFF: Which is not the compliant layer. It is a separate
11 dielectric layer, which is actually referred to in the claim, as well.

12 It is referred to as a dielectric protective layer which is provided over
13 the contact bearing surface of the semiconductor chip, and that dielectric
14 protective layer has apertures for chip contacts. It is not those apertures in
15 the dielectric protective layer that we are concerned with here, it is really the
16 Kwon -- Kwon's has the openings in the compliant layer and that's what
17 makes Kwon a different structure.

18 They form the openings in the compliant layer and they fill them up
19 with the metal and then so they have this metal via structure that -- that does
20 not end up as a bond ribbon, is not a bond ribbon connected to the chip
21 contacts, you know, extending along the sloping edge.

22 It is not a bond ribbon extending along the sloping edge of a
23 compliant layer because it is a via which -- which extends downward
24 through this hole in the compliant layer.

25 JUDGE RUGGIERO: But doesn't it follow -- it follows the contours
26 of the compliant layer, does it not?

1 MR. NEFF: Well, that -- it -- it does but that is not -- the requirement
2 of the claim is that the compliant layer has an edge surface, you know, and it
3 has a top surface, a bottom surface and edge between the top and bottom.

4 JUDGE RUGGIERO: What part of the claim are you referring to?

5 MR. NEFF: Okay. I'm referring to -- well, in -- in the first quote, the
6 one, two, three, fourth subparagraph, it starts this -- the first quote of the
7 handout, it -- we refer to wherein said compliant layer has a substantially flat
8 top surface and bottom surface attached to the protective layer and sloping
9 edges between the top surface and the bottom surface. And that -- that is the
10 surface that we are referring to, you know, that --

11 JUDGE RUGGIERO: I'm looking at the actual claim 35, so it says,
12 "selectively electroplating elongated bond ribbons atop the dielectric
13 protective layer and the compliant layer."

14 MR. NEFF: Sure.

15 JUDGE RUGGIERO: So far we have that in Kwon?

16 MR. NEFF: Well, we are not --

17 JUDGE RUGGIERO: Seems like we do.

18 MR. NEFF: We are taking the positions that -- position that Kwon
19 does not show bond ribbons. I mean --

20 JUDGE RUGGIERO: So let me see if I understand what you are
21 saying, then.

22 So layer 28 in Kwon meets all this language in the claim except that
23 you are saying it is not a ribbon. It is not a ribbon; right? It does everything
24 that's in this claim except that you are saying it is not a ribbon; is that right?

25 MR. NEFF: No.

26 JUDGE RUGGIERO: No, that's not right. Okay.

1 MR. NEFF: No. I mean the first requirement is that the compliant
2 layer has to have a sloping edge.

3 JUDGE NAPPI: Isn't that taught by Chen?

4 JUDGE WHITEHEAD: He doesn't rely on Kwon for that. He relies
5 on the secondary reference.

6 JUDGE RUGGIERO: There is a secondary reference, Chen.

7 JUDGE NAPPI: That would be page --

8 JUDGE RUGGIERO: 103.

9 JUDGE NAPPI: -- 4 in your handout.

10 MR. NEFF: Yes. Yes. Let me -- let me -- let me explain a little bit
11 about Kwon and Chen, also.

12 The -- Kwon was used in two ways to make the rejections, first as a
13 102 rejection saying the Examiner believed it showed everything, and then
14 the Examiner also said to the extent that Kwon may not show a transition
15 region, a first curved transition region, at the top of the sloped edge of the
16 compliant layer and a second curved transition region towards the bottom.
17 That's what he used Chen for.

18 And my -- what we have to say about Chen is that Chen itself teaches
19 no more than Kwon teaches with respect to a sloping edge. Chen -- I mean
20 Chen itself merely shows an opening in the insulating layer. That opening
21 is, again, a hole and a hole is not a -- the whole edge or the boundary of the
22 compliant layer.

23 So -- so that's what -- that's the only thing that Chen shows. With
24 respect to sloping edge, it shows no more than Kwon shows, just holes. It
25 shows that the hole has a little bit different profile and that's what the
26 Examiner wanted to use Chen for.

1 Okay. But I mean our position is that either one of these distinctions,
2 the sloping edge of the compliant layer that extends from the top surface to
3 the bottom surface or the bond ribbons that extend along that sloping edge,
4 are enough distinction over the prior art separately to distinguish the claims
5 from the prior art.

6 And we think the fact that there are both of these distinctions only
7 bolsters the distinction and the clearness that the rejection should be
8 withdrawn.

9 JUDGE RUGGIERO: Any questions?

10 MR. NEFF: Any other questions?

11 JUDGE RUGGIERO: Okay.

12 MR. NEFF: Okay. Thank you for your time.

13 (Whereupon, the proceedings at 1:45 p.m. were concluded.)